
AREVA

TRANSPORTATION OF SOLID IRRADIATED AND CONTAMINATED NON-FUEL RADIOACTIVE MATERIAL IN LARGE TRANSPORTATION PACKAGE

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AREVA

Reactors Accumulating Class B and C Irradiated Components

- **Options limited**
- **July 2008 Barnwell Disposal Facility closed to all but “in compact”**
- **Store in Spent Fuel Pool**
  - **Most pool cleaned out pre ’08 closing**
  - **Limits space for Spent Fuel Storage**
  - **Removal needs anticipated in 2-4 years**
- **Options**
  - **Disposal**
  - **On-site Storage**
  - **Off-site Storage**

TIME TO ACT - NOW !

Target Objectives

- **Viable for Extended, Interim Storage**
  - Reduced space requirements
  - Retrievable
- **Safe and Simple**
  - Utilize proven technology
  - Clone current technology
  - Minimize development costs
- **Maximize use of Sunk Costs**
  - Usable for future disposal
  - Utilize plant studies and in-place procedures
  - Use used fuel storage equipment
- **Minimize Risks**
  - Minimize size reduction requirements
  - Eliminate transfer cask/storage liner contamination
  - Minimize personnel radiation exposure
- **Versatile**
  - Disposal and transport compatible

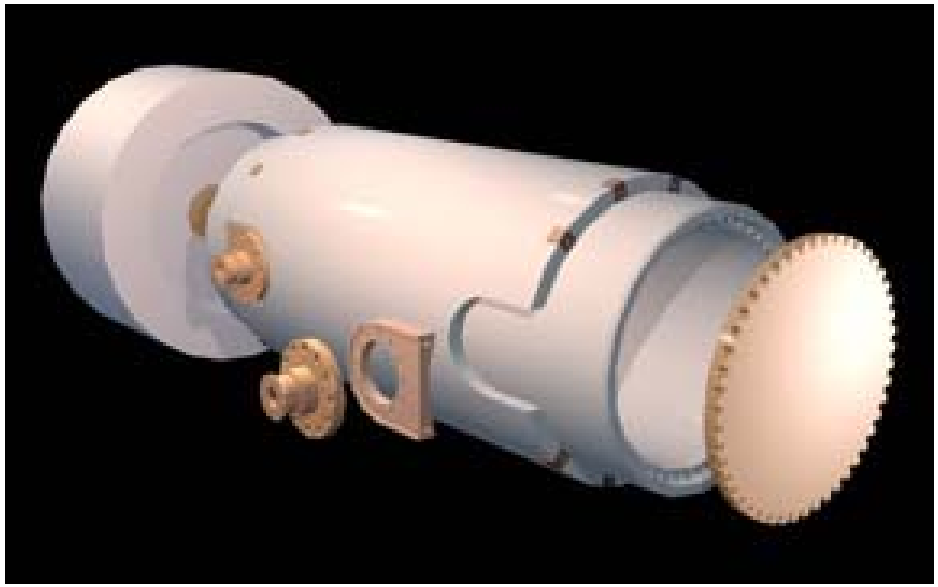
Technology Development

- **Convert NUHOMS® Dry Shielded Canister (DSC) to NUHOWS Rad Waste Canister (RWC)**
  - **Designed for long term interim storage**
  - **Easily adopted for irradiated hardwa**
  - **Large size – 200 CuFt**
  - **Allows for multiple loadings**
  - **Retrievable**
  - **Transportable**
  - **Risk adverse**

Rad Waste Container (RWC)

Technology Development

- **Utilize Existing NUHOMS® Used Fuel Transport Cask**
  - **MP 197 HB Cask**
  - **Incorporate irradiated hardware into license**
  - **Accepts larger canister**
  - **Minimizes transports**
  - **Minimizes handling**



MP 197 HB Transport Cask

Technology Development

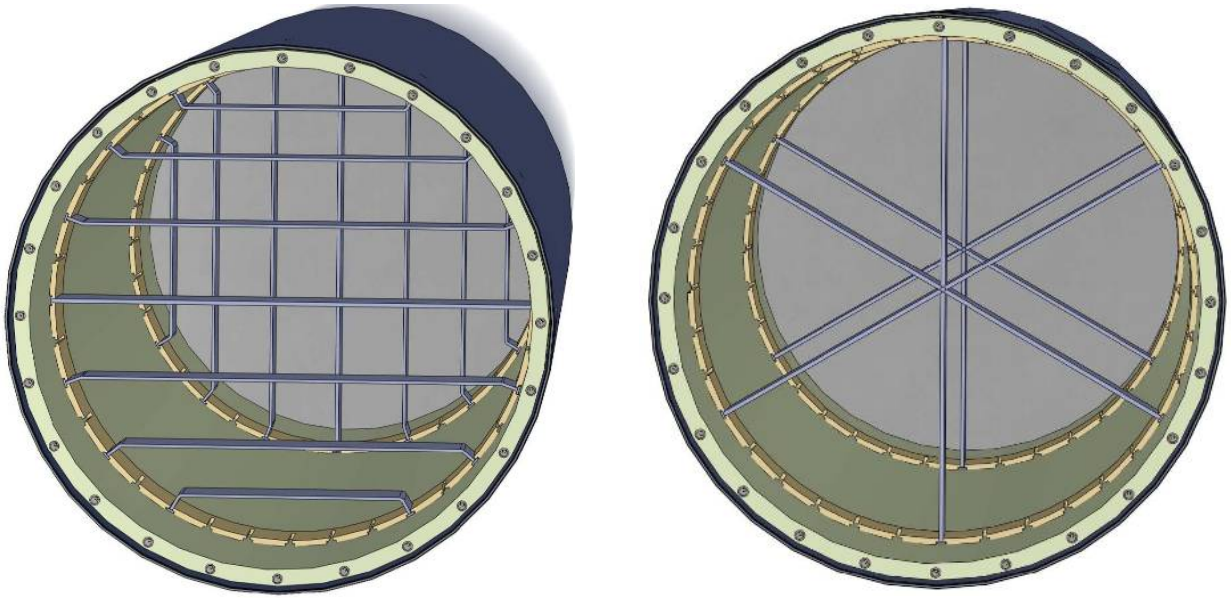
- **Utilize Existing NUHOMS® Horizontal Storage Module (HSM)**
  - **Package waste in RWC and transfer to HSM**
  - **Eliminates contamination of RWC and cask internals**
  - **Low dose approach**
  - **Adjustable shielding**
  - **Seamless integration with existing used fuel storage**
  - **Proven retrieval methodology**
  - **One HSM accommodates up to a decade of irradiated components**

Single Horizontal Storage Module

- **HSM like storage modules may also be used for those without existing Modules**
- **Storage inside a plant building may be used if needed**

Storage Canister

- **NUHOWS RWC similar to NUHOMS® DSC**
  - **RWC internal design allows loading flexibility**
  - **Internal configuration depends on type of irradiated components**



Two Possible RWC Internal Configurations

Loading Process

- **Transfer cask loaded in Spent Fuel Pool**
  - **Flexible design eliminates underwater size reduction**
  - **System design eliminates contamination of RWC and cask internals**

Transfer Cask in Pool

Placing Lid on RWC

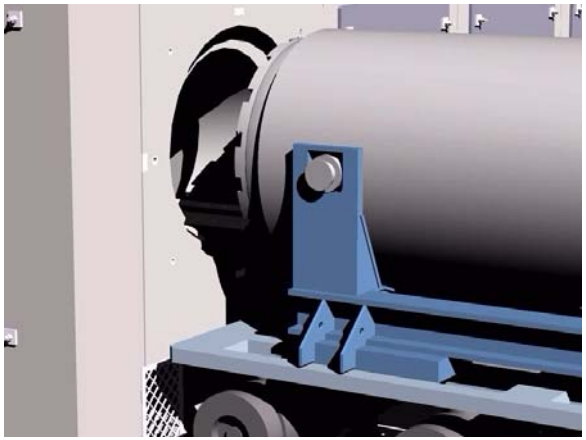
Transfer Process

- **Transport cask to storage location**
  - **RWC transfer cask/trailer available for use**
  - **Special haul paths not required**
  - **Horizontal transfer quicker than vertical**

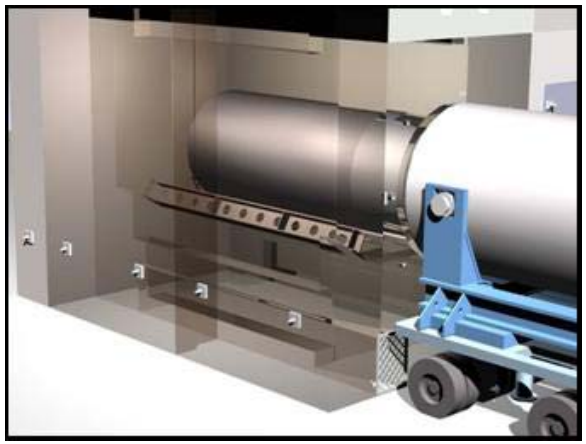
Transfer Cask on Transfer Trailer

Storage Process

- **Transfer cask to NUHOWS Horizontal Storage Module**
  - **Simple and low dose insertion into HSM**
  - **Concrete HSM provides robust radiation shielding**
  - **Transfer cask can remove RWC from HSM for repeated loadings**
  - **Reverse process for retrieval**
  - **Contamination free HSM**



RWC being Inserted into HSM



RWC Positioned in HSM

Transport Process

- **Transport for disposal**
  - **RWC removed from HSM and Loaded into MP197HB Transport Cask**
  - **Working with disposal site for future compatibility**
  - **Grout used in RWC prior to transport**
    - Additional shielding
    - Prevents movement of hardware
    - Meets disposal site void criteria
    - Eliminates free standing water

Transfer Cask on Transfer Trailer

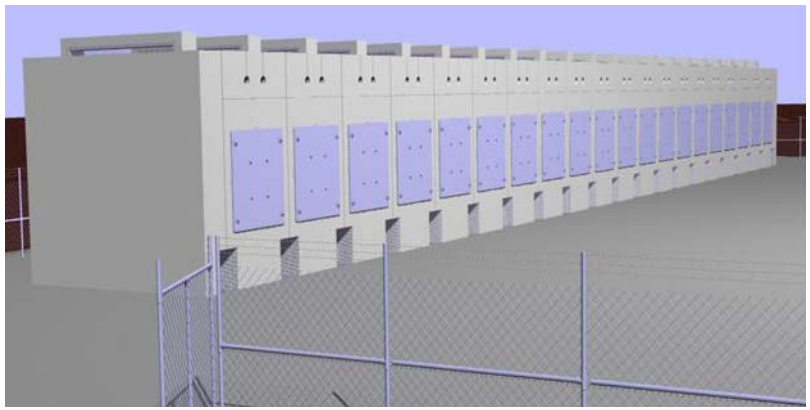
  - **RWC may be loaded directly in the MP197HB for transport to disposal site.**

Benefits

TN NUHOWS	
Features	**Benefits**
Horizontal loading is simpler process No stack-up evolution or shield bell required No outside heavy lifts Lower radiation levels	Enhanced human performance Reduced risk Reduced personnel radiation exposure
Most stable system No tip-over analysis	Reduced risk
Use of horizontal transfer trailer: No floor load concerns No interference concerns No road damage No haul path modifications	Reduced risk Reduced cost
Minimized underwater segmenting	Reduced risk Reduced project time Reduced personnel radiation exposure Material accountability
Elimination of liner contamination RWC is sealed	Reduced risk of personnel uptake Reduced risk of contamination spread Reduced cost with no HSM D&D required

The Future

- **Uncertainty of site availability for future disposal**
- **Changing disposal environment for Class B and C waste**
- **Mature storage technology cloned for added use**
  - **Flexibility and Reduced Risk to Accommodate Growing Need**



Utilizing existing technology to provide a unique storage solution